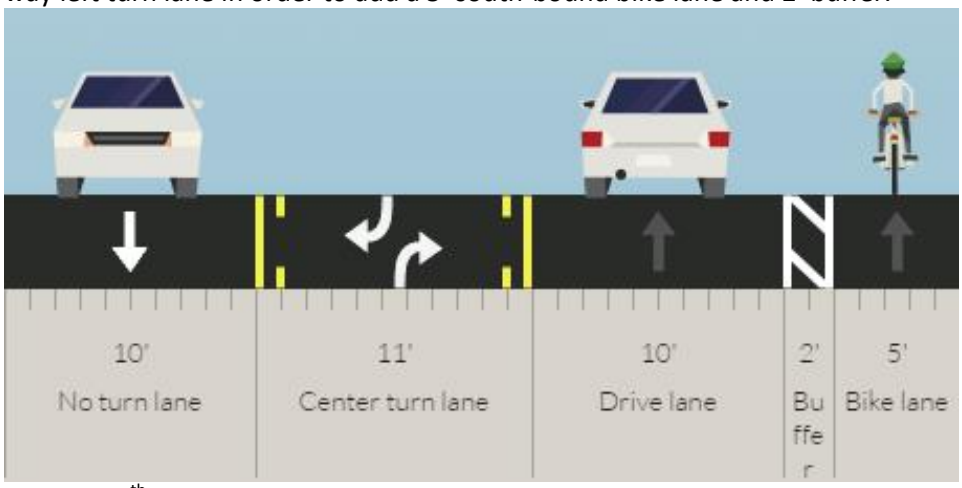
6th St from River Rd to W Kentucky St

Project Purpose, Scope, Approach, Budget & Timeline

The purpose of this project is to improve the bicycle network along 6th St between River Rd and Zane Street by reconfiguring lane widths and on-street parking between River Rd, Broadway and reducing travel lanes between Broadway and Kentucky to provide a buffered bike lane and adding shared lane markings from Kentucky Street to Zane St. The reconfigured cross-section improves safety for cyclists along the route and reduces the average vehicle speed within acceptable ranges of the posted speed limit. The excess pavement from the removed lane will be used to provide an additional buffer for cyclists by separating the bicycles from the vehicle travel lanes. This section of bike lane will improve connectivity by providing a direct link for cyclists between the River Walk multi-use trail and buffered bike lane on Kentucky St and shared lane that extends on 6th St after Zane St.

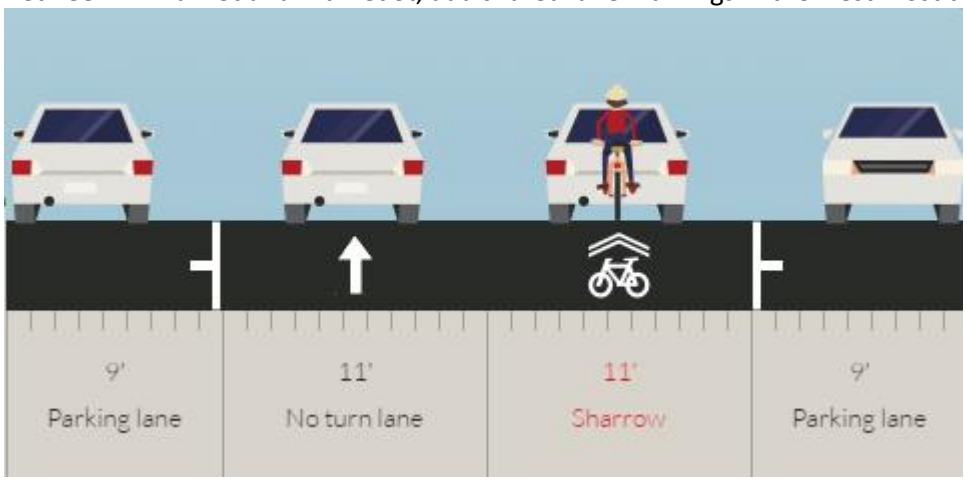
The changes to N 6th St are as follows:

1. Between River Rd and W Main St, reduce the width of the existing north-bound, south-bound and two-way left turn lane in order to add a 5' south-bound bike lane and 2' buffer.

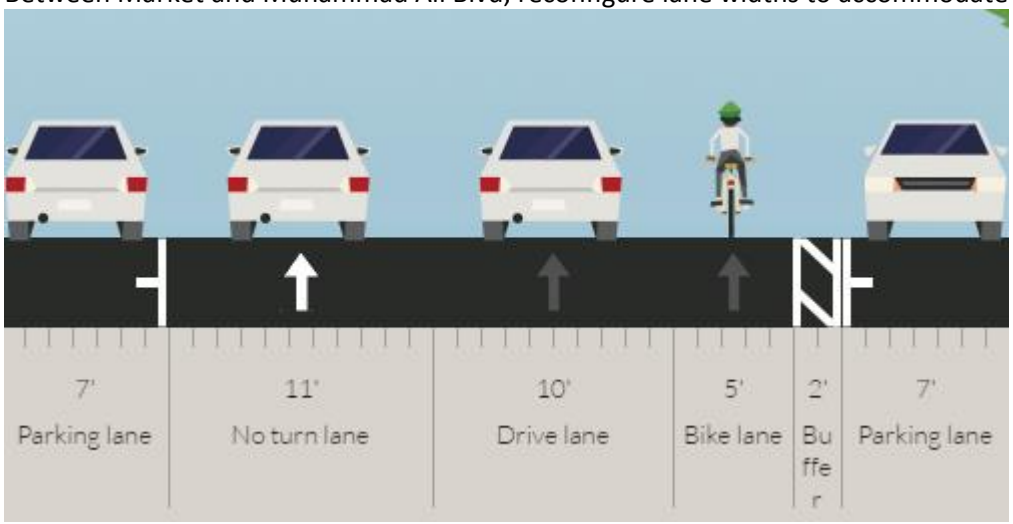


The changes to S 6th St are as follows:

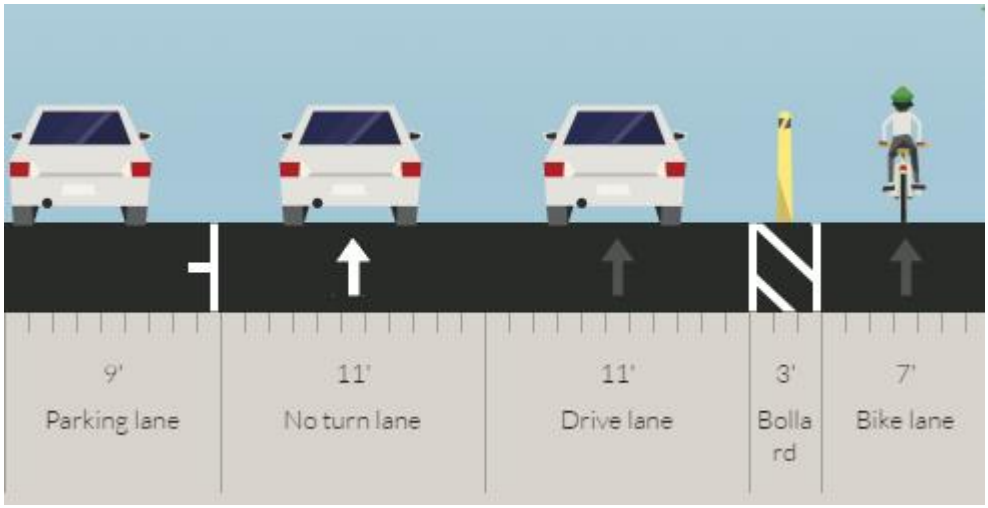
2. Between W Main St and Market St, add shared lane markings in the west most travel lane.



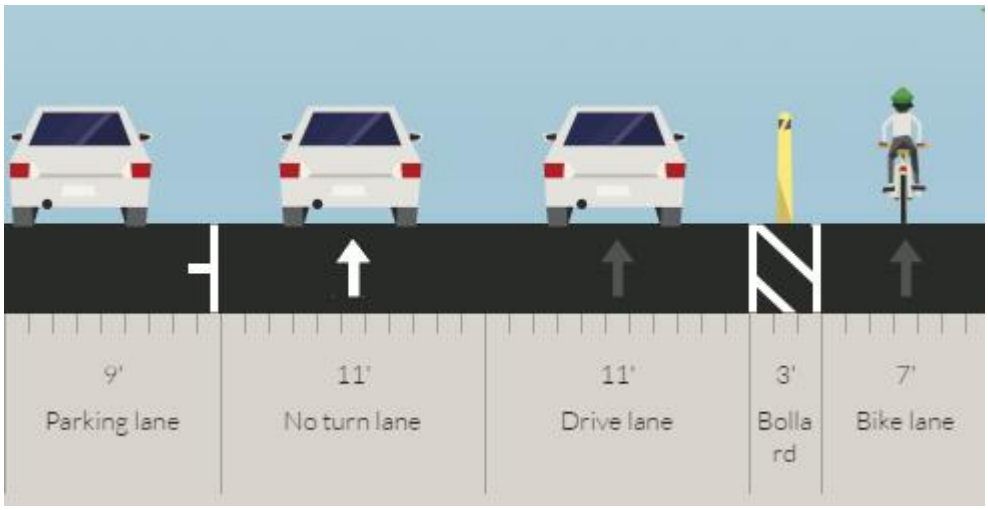
3. Between Market and Muhammad Ali Blvd, reconfigure lane widths to accommodate a 2’ and 5’ bike lane.



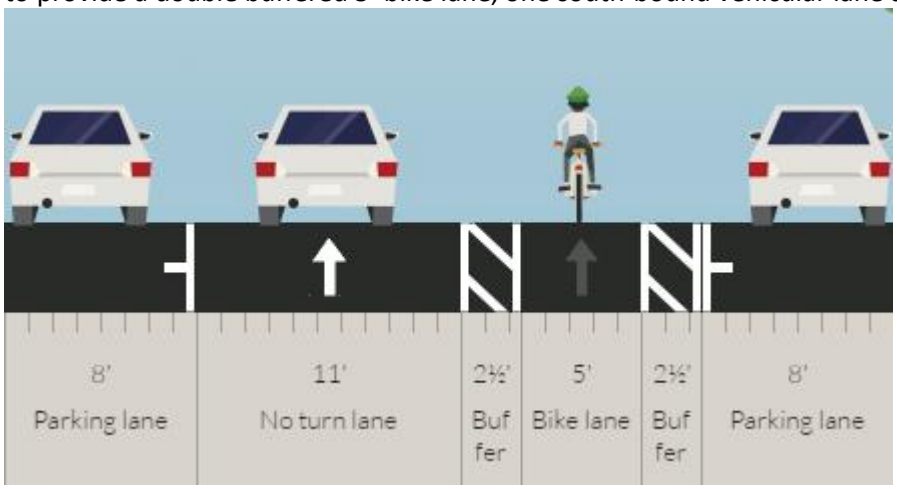
4. Between Muhammad Ali Blvd and W Chestnut St, relocate existing on-street parking on the west side of the street to provide a 5’ buffer and 7’ separated bike lane, and maintain the two south-bound vehicular travel lanes.



5. Between W Chestnut St and Broadway, relocate existing right lane on the west side of the street to provide a 5’ buffer and 7’ separated bike lane, and maintain the two south-bound vehicular travel lanes.



6. Between Broadway and W Kentucky St, repurpose one of the existing south-bound vehicular travel lanes to provide a double buffered 5’ bike lane, one south-bound vehicular lane and on-street parking.



7. Between W Kentucky St and Zane St, add shared lane marking in existing travels lanes.

To rate the success of this proposed project, a series of measures have been established that will provide a clear comparison between the pre-project and post-project traffic characteristics. The methods used to measure the effectiveness of this project have been detailed in this document and includes the following:

1. Collision study to determine the change in number and type of collisions
2. Speed studies to determine changes in prevailing speeds and percentage of drivers that are "excessive speeders" (10 mph or more above the posted speed limit)
3. Traffic counts and travel time studies to determine change in traffic volumes, lane utilization and traffic delays
4. Bike counts to determine change in ridership

Budget:

This project will be funded thru Mayor Greg Fischer's Urban Bike Network allocation established in the 2016 Fiscal Year budget. The design and engineering for this project is to be provided by the Departments of Public Works & Assets with assistance from Gresham, Smith & Partners.

Measurements of Effectiveness

1. Collision Reductions:

To determine the effectiveness of the roadway treatments in improving the collision rates, a comparison of the collision types occurring before and after the improvements will be conducted. The collision history for the last three years will be gathered through the Kentucky State Police's Collision Data website. Queries will be conducted in accordance with the *Collision Reporting Guideline* and the data obtained will be ranked by Manner of Collision and Directional Analysis. Each type of collision will then be converted to a specific collision type per vehicle mile traveled using the current traffic volumes for this section of roadway.

Upon completion of the road reconfiguration project, collisions within the boundary of the project will be evaluated monthly for the first 6 months in order to identify any immediate deficiencies. After the first 6 months, collisions will then be evaluated every 6 months for 3 years. Once the three years of collision history has been gathered, a comparison can be made between the pre- and post-project collision rates to determine effectiveness.

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The road reconfiguration should show improvements in the number of sideswipe (same & opposite direction) and single vehicle collisions in which the vehicle left the roadway and collided with a fixed object. There should also be modest reductions in the rate of opposing left turn and rear end collisions since the total number of conflicts will be reduced. There should also be no increase in the number of cyclist and pedestrian related collisions despite an increase in the total number of users.

Collision Analysis:

The collision history for this section of road was obtained through the Kentucky State Police's public crash analysis website. A query was conducted using the values listed in the attached collision report spreadsheet and the manner of collision was analyzed to determine the type of counter measure that would be best suited to reduce or eliminate each collision.

Collision History for 6th St from River Rd to W Kentucky St between 1/1/2012 to 7/1/2015 (Top 4 Collision Types)

Manner of Collision	Total # Collisions	Total # Injuries	Total # Correctable Collisions	Total # Correctable Injuries
ANGLE	59	29	14	3
SIDESWIPE – SAME DIRECTION	46	8	11	3
REAR END	26	11	6	1
BACKING	13	2	3	1
Total Collisions	**144**			
Total Injuries		**50**		
Total # of Correctable Collisions			**34**	
Total # of Correctable Injuries				**8**

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Cost Estimate:

Estimate	Quantity		Unit Price		Extention
Remove existing lane lines =	5,756	ft @	$0.52	per ft =	$2,992.86
Remove existing arrows =	22	ea @	$50.00	per ea =	$1,100.00
Paint 4" solid parking =	6,018	ft @	$0.16	per ft =	$962.88
Paint 4" solid-skip driving =	677	ft @	$0.16	per ft =	$108.32
Paint 4" double solid driving =	1,354	ft @	$0.16	per ft =	$216.64
Paint 4" skip driving =	871	ft @	$0.16	per ft =	$139.36
Paint 4" solid driving =	580	ft @	$0.16	per ft =	$92.80
Thermo 6" solid biking =	1,425	ft @	$0.64	per ft =	$912.00
Paint 4" solid buffer/driving =	3,332	ft @	$0.16	per ft =	$533.12
Paint 4" solid buffer/biking =	5,928	ft @	$0.16	per ft =	$948.48
Paint 4" solid buffer/parking =	2,589	ft @	$0.16	per ft =	$414.24
Thermo 6" solid biking/parking =	82	ft @	$0.64	per ft =	$52.48
Thermo 6" dotted lines =	547	ft @	$0.64	per ft =	$350.08
Thermo bike symbol 9C-3B =	27	ea @	$130.00	per ea =	$3,510.00
Thermo bike symbol 9C-3B w/ arrow =	1	ea @	$130.00	per ea =	$130.00
Thermo bike symbol 9C-9 =	13	ea @	$130.00	per ea =	$1,690.00
Solid 4" paint cx hatch =	13,223	sqft @	$0.75	per sqft =	$9,917.25
Solid 8" paint cx hatch =	475	sqft @	$1.50	per sqft =	$712.50
Left Turn Arrow =	6	ea @	$130.00	per ea =	$780.00
Left Combo Arrow =	3	ea @	$110.00	per ea =	$330.00
Right Turn Arrow =	8	ea @	$130.00	per ea =	$1,040.00
Right Combo Arrow =	1	ea @	$110.00	per ea =	$110.00
Thru Arrow =	13	ea @	$130.00	per ea =	$1,690.00
Green skip paint =	1,314	sqft @	$7.95	per sqft =	$10,446.30
Flexible Delineator Post =	12	ea @	$99.60	per ea =	$1,195.20
Flexible Delineator Post install =	72	ea @	$46.00	per ea =	$3,312.00
Bike signage =	18	ea @	$100.00	per ea =	$1,800.00
				SUB TOTAL =	$45,486.51
				(10%) =	$4,548.65
				TOTAL =	$50,035.16

2. Traffic Volume, Speed & Travel Time:

To determine the effectiveness of the roadway treatments and its impact to the traffic flow and volumes, several pre- and post-project traffic counts and travel time studies will be conducted. Comparisons will be made between the before and after counts to determine the total change in traffic volume, the change in the average and 85th percentile speed, and the change in the travel time and delay for vehicles utilizing this section of road. The data gathered during the pre-project surveys will also be used to calibrate the traffic simulation models for the project corridor.

A travel time and delay study will be conducted in accordance with attached *Travel Time Study Guidelines*, and will be used to determine the impact the road reconfiguration has on the quality of traffic movement along the route.

Pre-project traffic counts -

Count 1:

Location: S 6th St between Jefferson & Liberty
Equipment: NC-300 Traffic Analyzer
Date: 7/20/15

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Curb travel lane:

1,021 ADT with **24.04 mph** 85th percentile

Center travel lane:

2,770 ADT with **29.08 mph** 85th percentile

Right travel lane:

1,850 ADT with **24.55 mph** 85th percentile

Total for all lanes:

5,641 ADT with **26.68 mph** 85th percentile

Count 2:

Location: S 6th St between York & Breckinridge, near 831 S 6th St

Equipment: NC-300 Traffic Analyzer

Date: 7/15/15

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Left travel lane:

1,542 ADT with **40.04 mph** 85th percentile

Right travel lane:

1,744 ADT with **36.02 mph** 85th percentile

Total for all lanes:

3,286 ADT with **37.91 mph** 85th percentile

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Count 3:

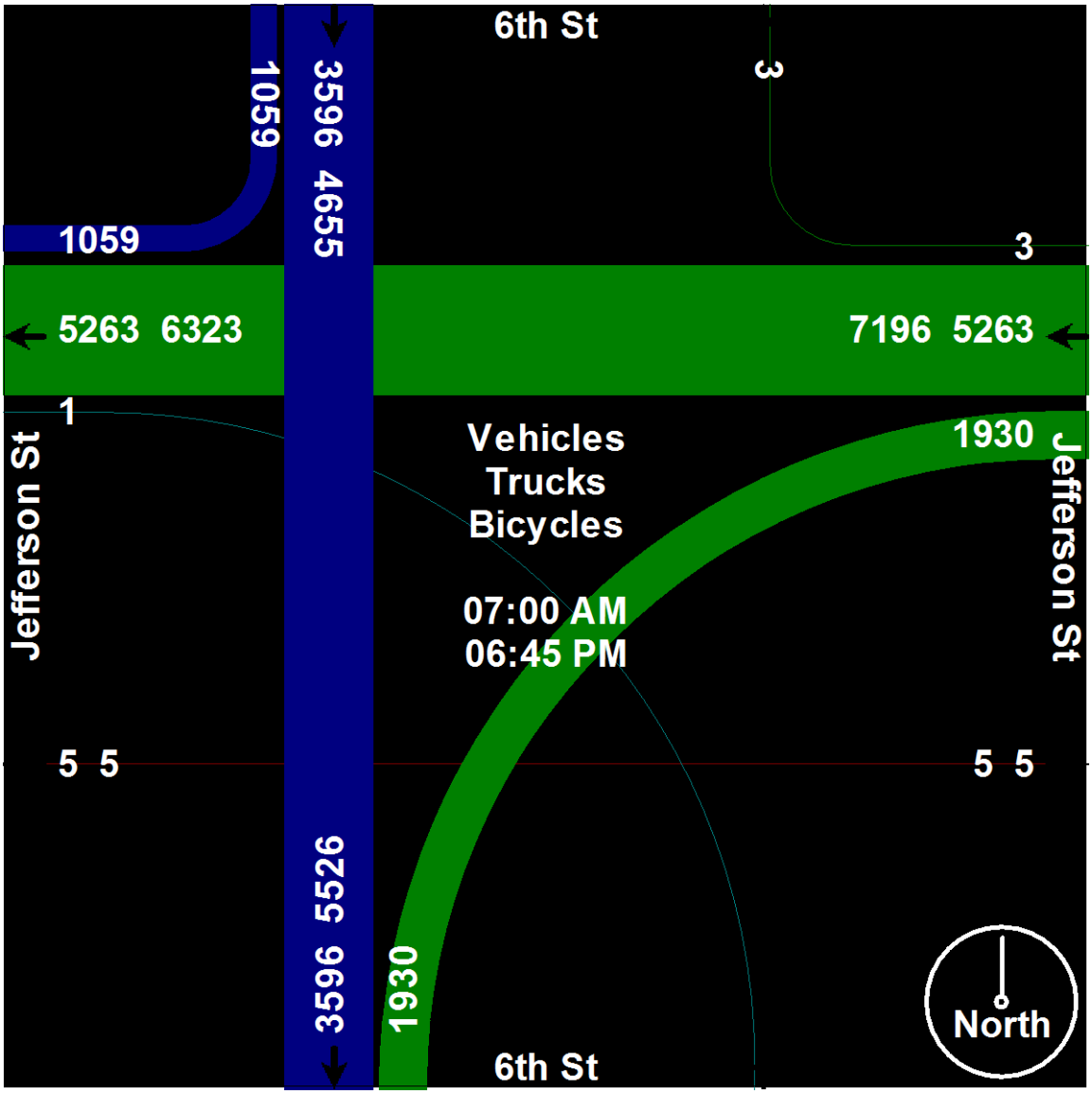
Location: S 6th St & Jefferson St

Equipment: Mio-Vision

Date: 12-hour count conducted 12/16/08

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



6th St from River Rd to W Kentucky St

Project Purpose, Scope, Approach, Budget & Timeline

Count 4:

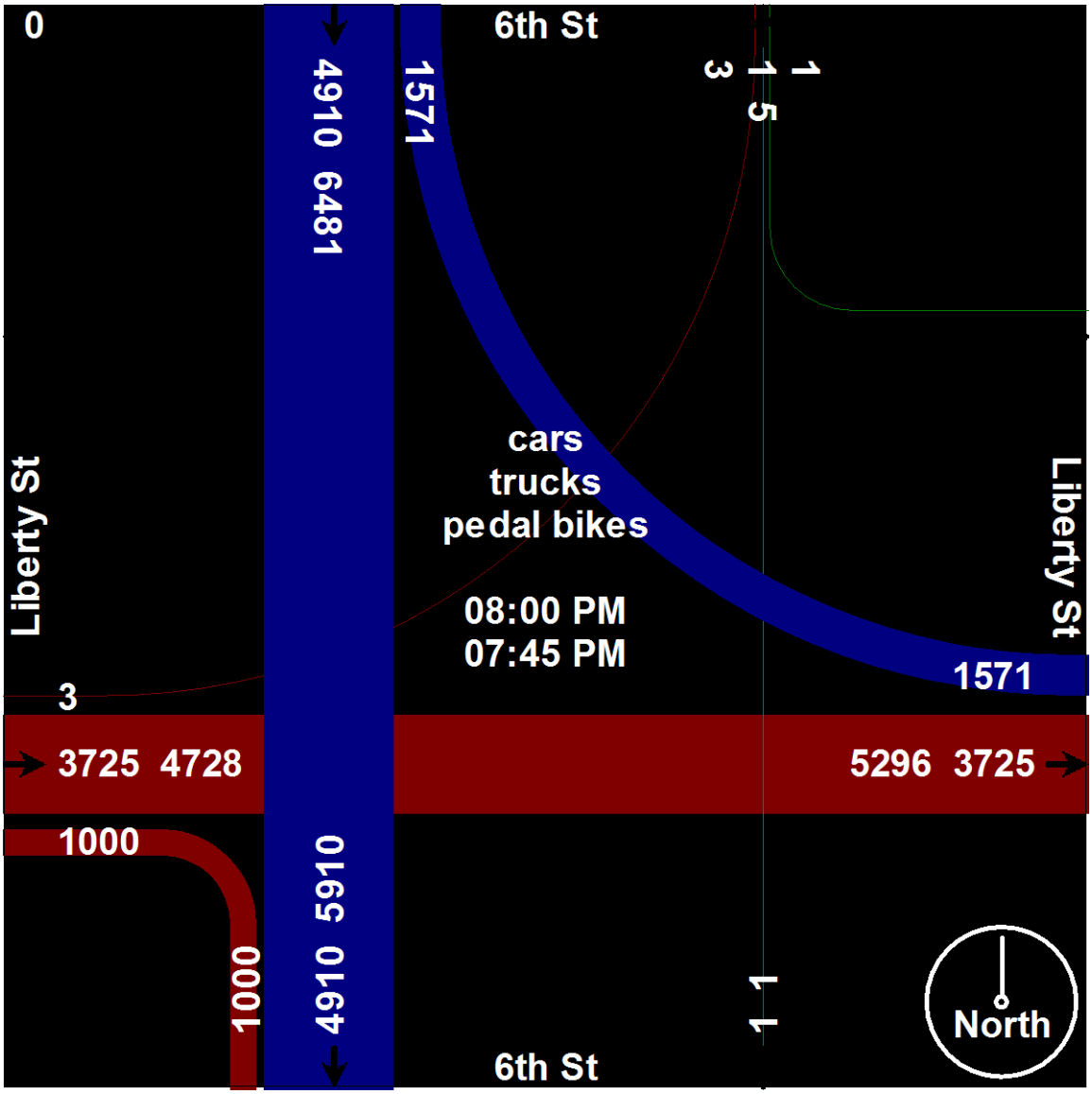
Location: S 6th St & Liberty St

Equipment: Mio-Vision

Date: 12-hour count conducted 6/17/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



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Count 5:

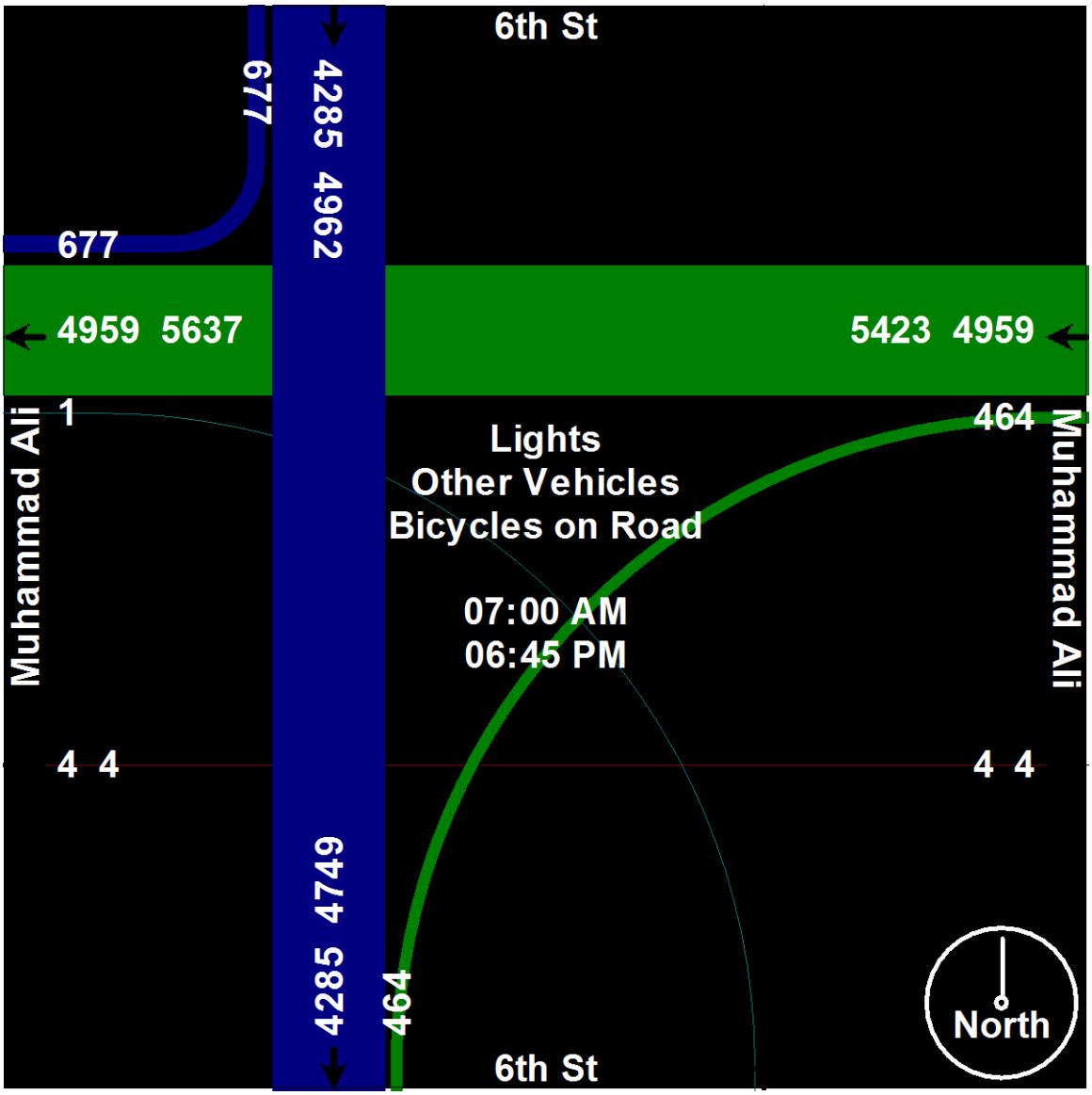
Location: S 6th St & Muhammad Ali

Equipment: Mio-Vision

Date: 12-hour count conducted 6/25/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



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Count 6:

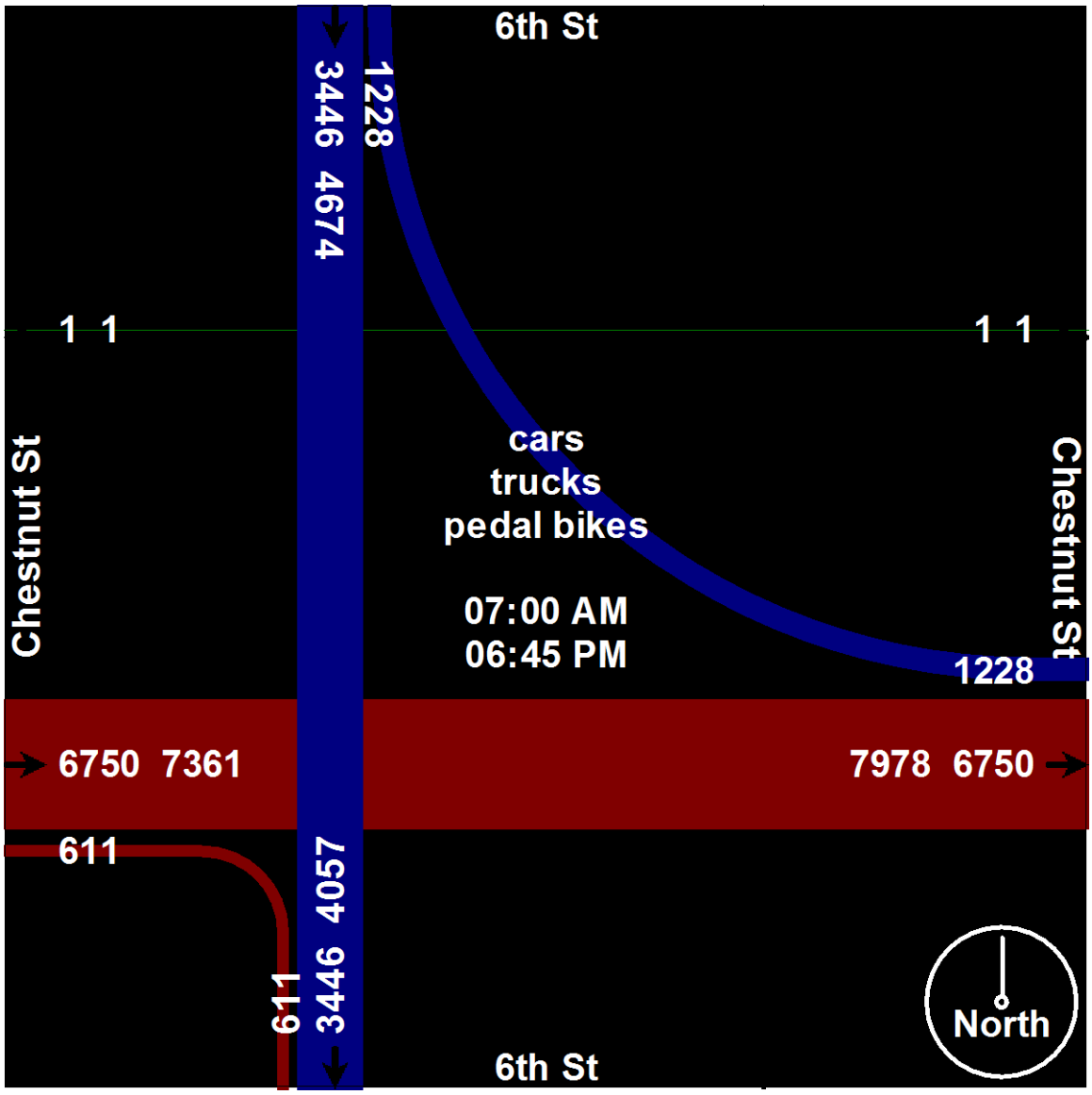
Location: S 6th St & Chestnut

Equipment: Mio-Vision

Date: 12-hour count conducted 6/24/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

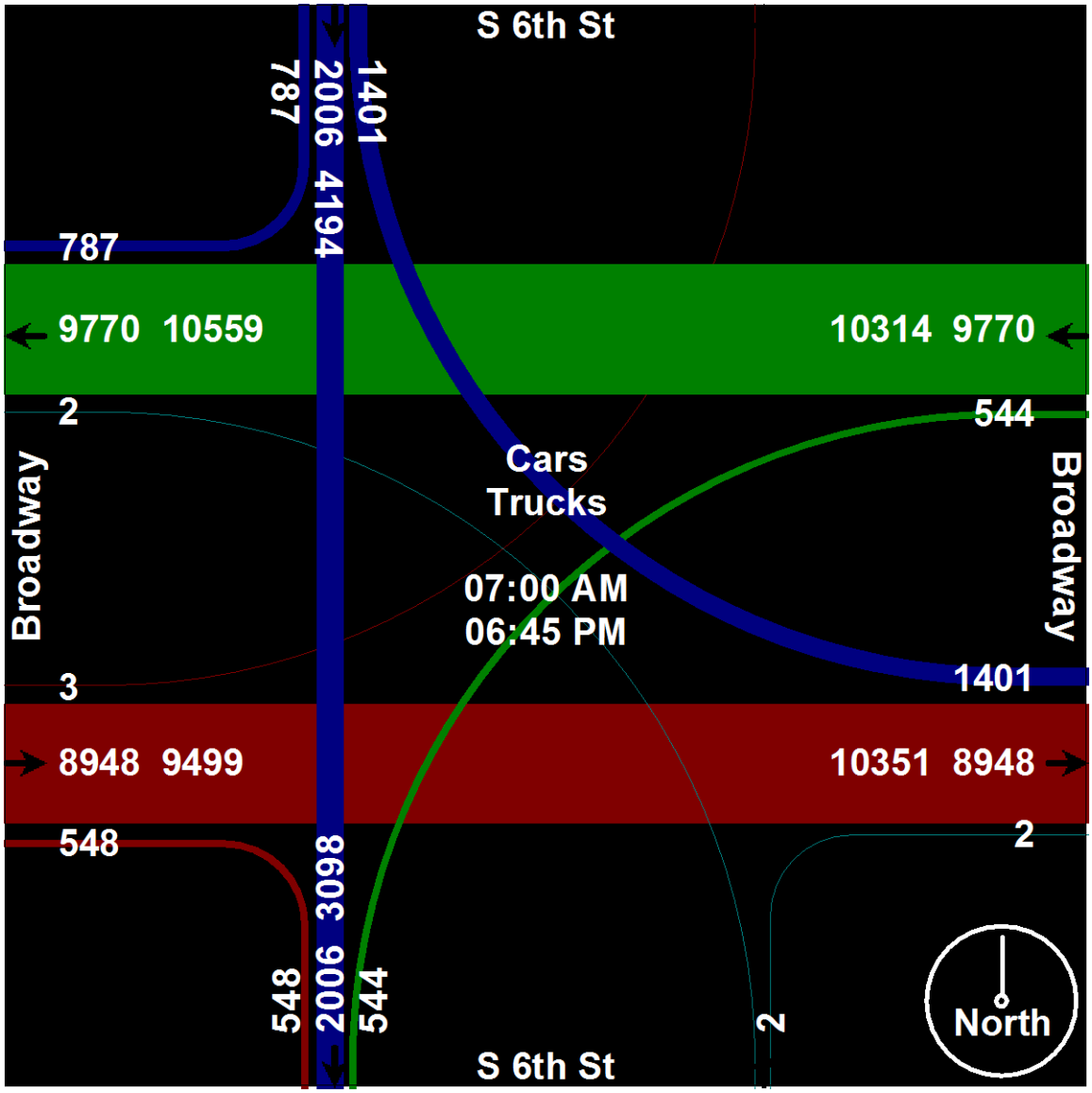
Results:



Count 7:

Location: S 6th St & Broadway
Equipment: Mio-Vision
Date: 12-hour count conducted 4/29/15
Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



Count 8:

Location: S 6th St & York
Equipment: Mio-Vision
Date: 12-hour count conducted 5/5/15
Data: This will be a 12-hour turning movement count at the signalized intersection.

6th St from River Rd to W Kentucky St

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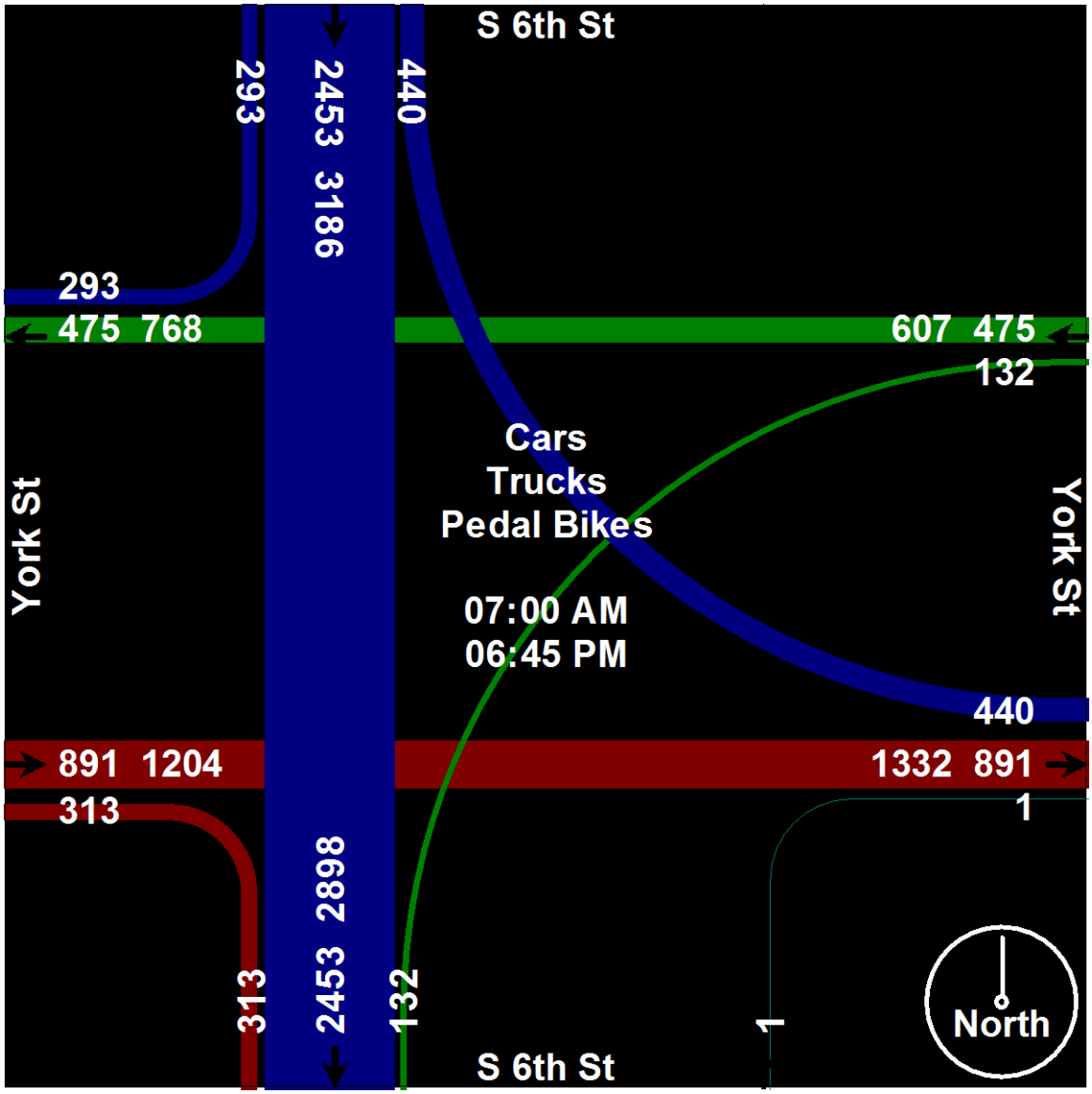
Results:



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Count 9:

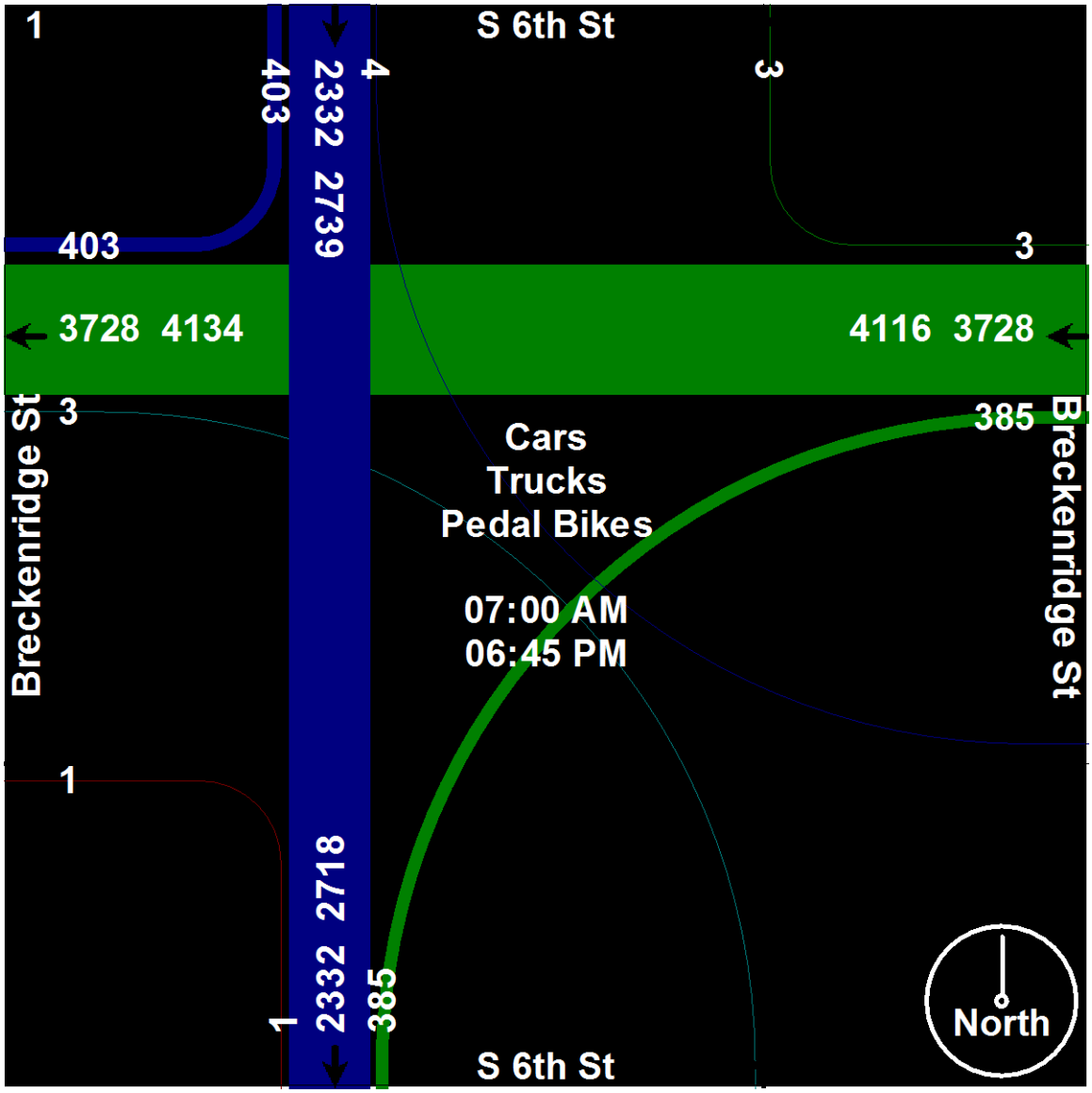
Location: S 6th St & Breckinridge

Equipment: Mio-Vision

Date: 12-hour count conducted 5/6/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



6th St from River Rd to W Kentucky St

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Count 10:

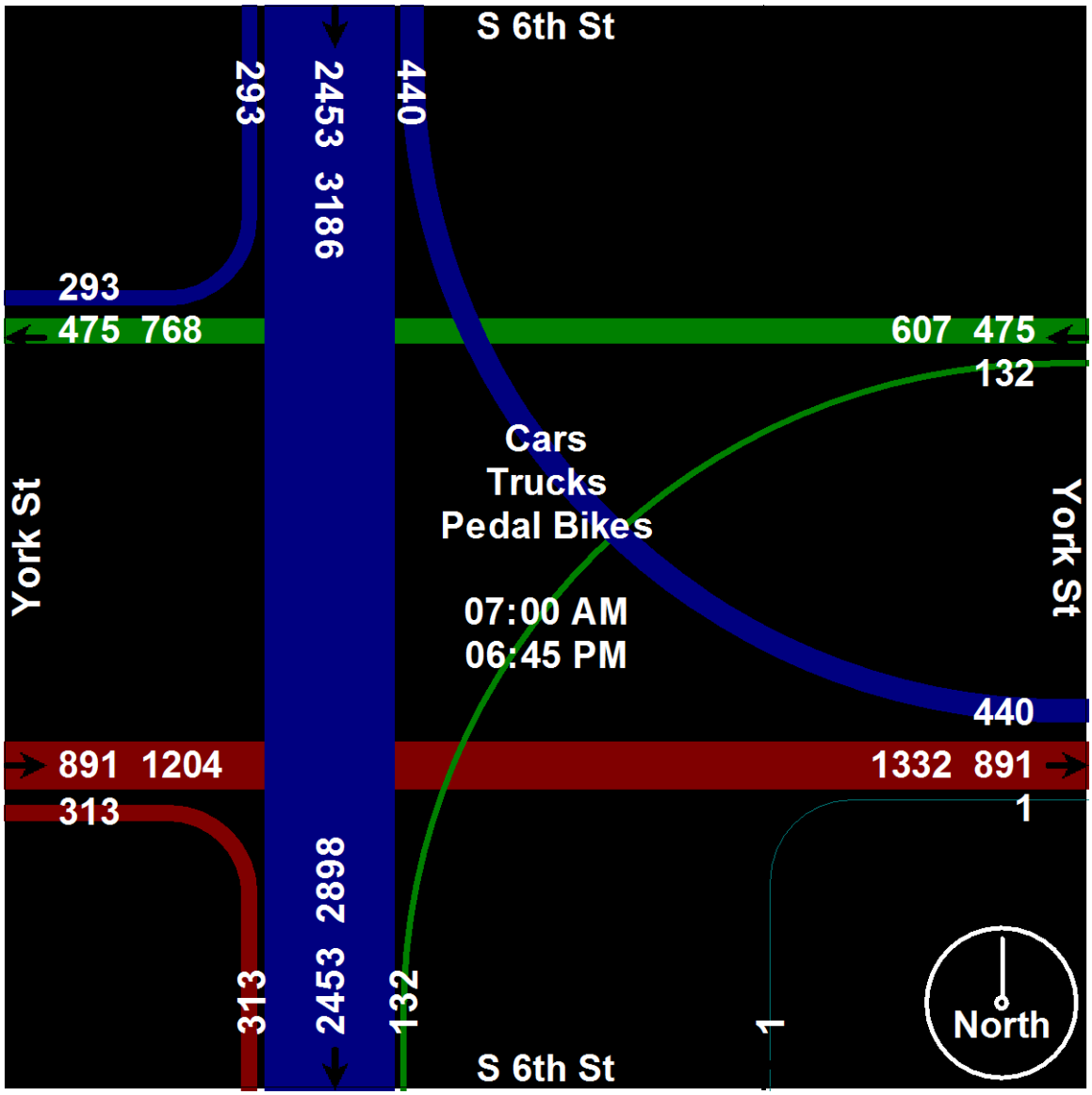
Location: S 6th St & York

Equipment: Mio-Vision

Date: 12-hour count conducted 5/5/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



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Count 11:

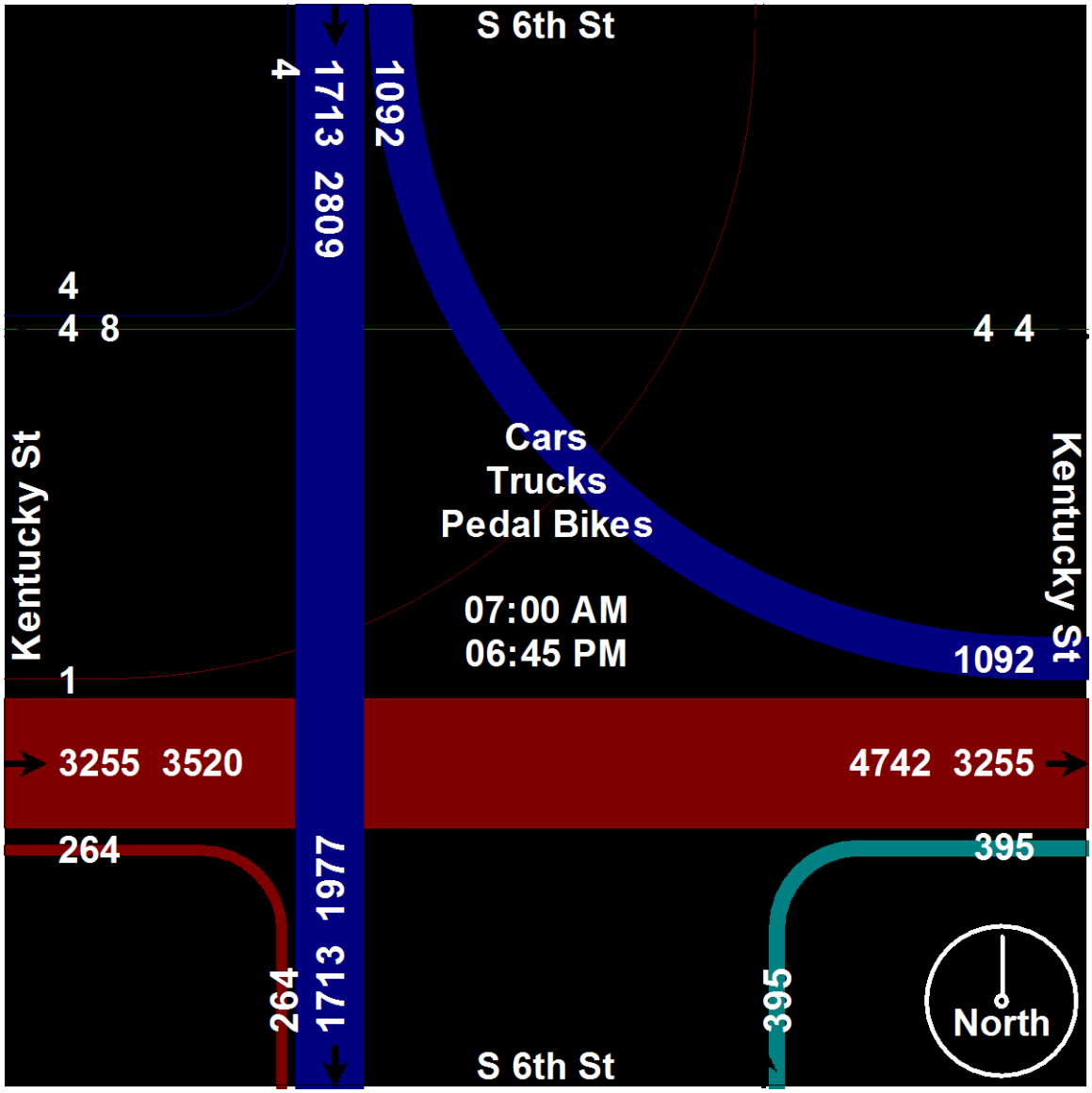
Location: S 6th St & Kentucky

Equipment: Mio-Vision

Date: 12-hour count conducted 5/6/15

Data: This will be a 12-hour turning movement count at the signalized intersection.

Results:



3. Bike lanes:

To determine the effectiveness of the bike lanes, counts will be conducted before and after the project. This before and after comparison will demonstrate the change in ridership associated with the dedicated bike lanes.

Mio-Vision or pneumatic tube counters will be placed at several locations to gather data on the total number of cyclists traveling in each direction in the corridor. Mio-Vision will be placed for 48 hours at each location while pneumatic tube counters will be placed at each location for about 1 week and during more favorable weather conditions. Additional bicycle counts can also be taken as part of the Mio-Vision turning movement counts conducted to determine traffic volumes at the intersections.

Pre-project bicycle counts -

Count 1:
Location: S 6th St & Jefferson
Equipment: Mio-Vision
Dates: 12/16/08 from 7:00am to 7:00pm
Total cyclists on S 6th St = 5

Count 2:
Location: S 6th St & Liberty
Equipment: Mio-Vision
Dates: 6/17/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 10

Count 3:
Location: S 6th St & Muhammad Ali
Equipment: Mio-Vision
Dates: 6/25/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 14

Count 4:
Location: S 6th St & Chestnut
Equipment: Mio-Vision
Dates: 6/25/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 28

Count 5:
Location: S 6th St & Broadway
Equipment: Mio-Vision
Dates: 4/1/08 from 7:00am to 7:00pm
Total cyclists on S 6th St = 11

Count 6:
Location: S 6th St & York
Equipment: Mio-Vision
Dates: 5/5/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 15

Count 7:
Location: S 6th St & Breckinridge St
Equipment: Mio-Vision
Dates: 5/5/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 26

Count 8:
Location: S 6th St & Breckinridge St
Equipment: Mio-Vision
Dates: 5/6/15 from 7:00am to 7:00pm
Total cyclists on S 6th St = 30

Count 9:
Location: S 6th St & Jefferson
Equipment: Mio-Vision
Dates: 8/5/15 10:00am to 8/7-15 10:00am
Total cyclists on S 6th St = 33

Count 10:
Location: S 6th St & Breckinridge St
Equipment: Mio-Vision
Dates: 7/27/15 7:00am to 7/29/15 7:00am
Total cyclists on S 6th St = 19

Post-project counts shall be conducted at the above locations several months after the completion of the project to compare the change in ridership along this section of road. Annual counts will be conducted and the data extracted will be used to establish trends in ridership along S 6th St. Data extracted from future counts will also be used in extrapolating the latent demand that may exist in other areas of the city to aid in the design of future road reconfiguration projects.